



The Global Methane Initiative

Climate change is affecting our environment and people around the world. Greater energy efficiency, strategies to reduce greenhouse gases (GHGs), and new technologies hold promise for addressing this global challenge. Using methane, the second most important GHG, as a clean energy source offers a unique opportunity to mitigate climate change and simultaneously increase available energy supply. Efforts to mitigate, recover, and utilize methane emissions can provide significant energy, economic, and environmental benefits. The Global Methane Initiative (GMI) promotes international action to address climate change while developing clean energy and stronger economies.

Origins of GMI

The Methane to Markets Partnership was launched in November 2004 at a Ministerial Meeting in Washington, D.C., when 14 national governments formally committed to minimize methane emissions from key sources, stressing the importance of implementing methane capture and use projects in developing countries and countries with economies in transition.

In 2010, building on the strong accomplishments and successful track record of international cooperation through the Methane to Markets Partnership, GMI was launched with an expanded scope. The Partners expanded the GMI mission beyond methane recovery and use to also include methane abatement and avoidance, as well as to add a new sector—municipal wastewater. GMI Partner Countries agreed to develop national action plans to coordinate methane reduction efforts domestically and abroad, appropriate for both developing and developed Partner Countries to outline their needs and opportunities

and their plans to assist other countries. Developed Partner Countries, as well as others in the broader international community, were encouraged to provide financial commitments to accelerate global methane mitigation efforts.

Goals and Benefits

GMI's goals are to reduce global methane emissions to address climate change, enhance economic growth, strengthen energy security, and improve local environmental quality and industrial safety. GMI brings together the public and private sectors to develop projects that can reduce emissions from the agriculture, coal mines, municipal solid waste, municipal wastewater, and oil and gas sectors.¹

Today, GMI Partners collectively contribute approximately 70 percent of the world's anthropogenic (or manmade) methane emissions. Cumulative methane emission reductions achieved through GMI total more than 159 million metric tons of carbon dioxide equivalent (MMT_{CO₂}E).

159 MMT_{CO₂}E

*cumulative methane emission reductions
attributed to GMI*

GMI Partner Countries work with both public and private sector organizations to advance methane abatement, recovery, and use by providing project development and implementation support, training and capacity building, technology demonstration and deployment, and market development.

¹ "Landfills" has been changed to "Municipal Solid Waste" at the subcommittee's request to better reflect the full spectrum of potential abatement activities under GMI.

Significant potential remains for further cost-effective methane emission reductions. By 2020, global methane reduction potential is estimated to approach 1,800 MMTCO₂E at a breakeven price of \$30 MTCO₂E.² Because methane is a short-lived atmospheric gas, reducing methane emissions will have important near-term benefits for mitigating climate change.

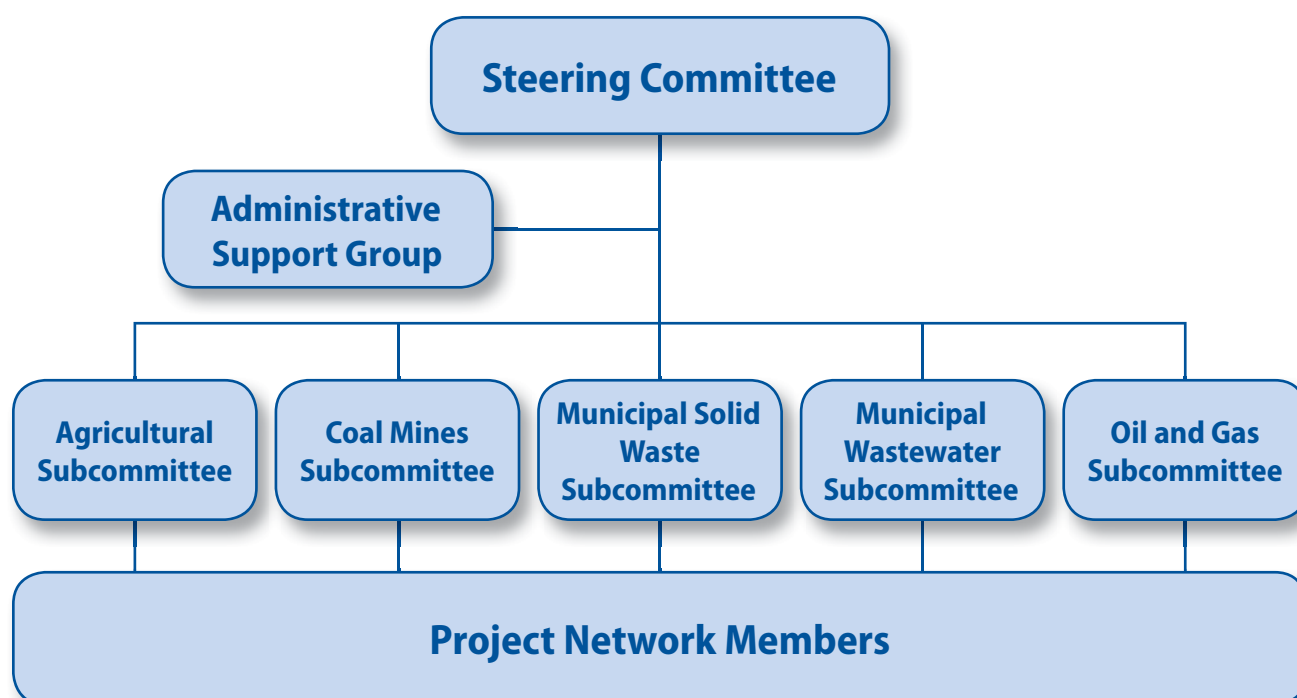
Organizational Structure

GMI brings together national governments, industry, nongovernmental organizations (NGOs), and other stakeholders to advance project development around the world. The Initiative is structured around the Steering Committee, the Administrative Support Group (ASG), five technical subcommittees, and the Project Network, which comprises representatives from the private sector and

NGOs (see Figure 1). Together, the Initiative's branches are working to overcome the sector-specific barriers impeding methane emission reduction project development.

The Steering Committee guides the work of the Partnership and is supported by the ASG, or secretariat, which is housed at the U.S. Environmental Protection Agency (EPA). The technical sector subcommittees—Agriculture, Coal Mines, Municipal Solid Waste, Municipal Wastewater, and Oil and Gas—are responsible for guiding and assessing sector-specific activities and engaging Partner Country delegates and Project Network members. Each subcommittee has also developed an action plan for coordinating and implementing these activities as a means of building capacity, transferring technology, and promoting private investment.

Figure 1: GMI Organizational Structure



² U.S. EPA, *Global Mitigation of Non-CO₂ Greenhouse Gases* (EPA Report 430-R-06-005), 2006. www.epa.gov/climatechange/Downloads/EPAactivities/GlobalMitigationFullReport.pdf.

The Importance of Methane

Methane (CH_4) is a potent GHG that is 25 times more effective at trapping heat than CO_2 over a 100-year timeframe.³ Annual methane emissions are the second most abundant GHG after CO_2 , with an estimated 7,196 MMTCO₂E emitted from anthropogenic (or manmade) sources in 2010.⁴ Anthropogenic sources of methane include oil and natural gas production, coal mining, municipal solid waste (e.g., landfills), municipal wastewater, and agriculture (including livestock manure).

Anthropogenic sources of methane have increased over time, causing the atmospheric concentration of methane to grow 150 percent since 1750. Without more aggressive measures, methane emissions are expected to increase nearly 20 percent by 2030, continuing an upward trend far above the natural level of methane.⁵

Reducing methane emissions can significantly slow near-term climate change impacts because methane has a relatively short atmospheric lifetime of about 12 years. Methane also is the primary component of natural gas, so capturing and utilizing methane as a clean-burning energy source can promote sustainable development and energy security. Additionally, reducing methane emissions can avoid the negative health effects (e.g., breathing problems, asthma attacks, reduced lung function, lung diseases) and premature deaths associated with unhealthy ozone levels. Recent studies estimate that aggressive actions to reduce methane emissions would reduce ozone air pollution globally and could avoid roughly 400,000 premature ozone-related deaths by 2030.⁶



³ Intergovernmental Panel on Climate Change (IPCC), *Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, 2007. www.ipcc.ch/publications_and_data/ar4/wg3/en/contents.html.

⁴ U.S. EPA, *Global Anthropogenic Emissions of Non- CO_2 Greenhouse Gases: 1990–2030* (EPA Report 430-R-12-006), 2012. www.epa.gov/climatechange/EPAactivities/economics/nonco2projections.html.

⁵ U.S. EPA, 2012.

⁶ UNC Global, UNC Studies, *Global Coalition Agree: Decreasing Short-term Greenhouse Gases Benefits Climate, Health*, 2012. http://global.unc.edu/index.php?option=com_content&view=article&id=3006&Itemid=94.

The GMI Partnership Continues To Grow

GMI now comprises 40 Partner Countries and the European Commission, as well as more than 1,100 diverse organizations from six continents who participate in the

Project Network. This growth represents nearly a tripling in the number of Partners (see Figure 2) and a 10-fold increase in Project Network members since 2004.⁷

Figure 2: GMI Partner Countries



⁷ As of November 2012.

U.S. Government Leadership in Reducing Methane Emissions

U.S. government efforts under GMI are led by EPA and involve the collective efforts of other federal agencies and departments, including the Department of State, the Department of Agriculture, the Department of Energy, the Agency for International Development (USAID), and the U.S. Trade and Development Agency (USTDA).

In 2004, the United States pledged up to \$53 million over a five-year period to help facilitate the development and implementation of methane projects in developing

countries and countries with economies in transition. In 2010, the United States pledged another \$50 million to ensure the success of the GMI over the next five years. These resources will help support diverse activities, including prefeasibility and feasibility studies at potential project sites and capacity-building through technology transfer and training. Funding will also be used to support the development of tools and resources and the work of the ASG across more than two dozen Partner Countries (see Figures 3 and 4).

Figure 3: FY 2011 U.S. Expenditures by Type of Activity

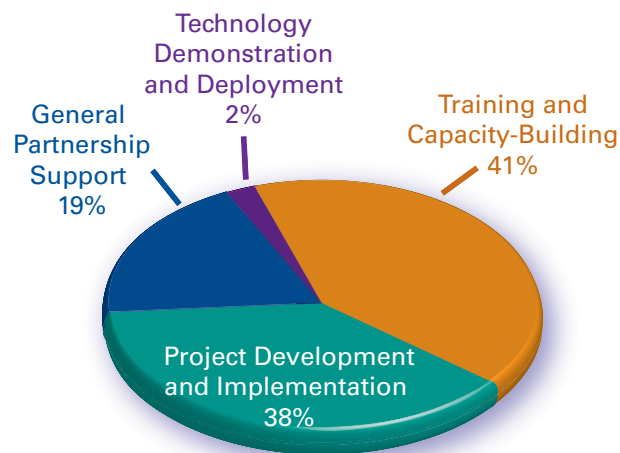
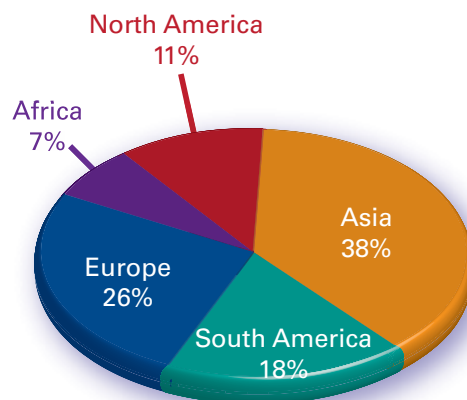


Figure 4: FY 2011 U.S. Expenditures by Region⁸

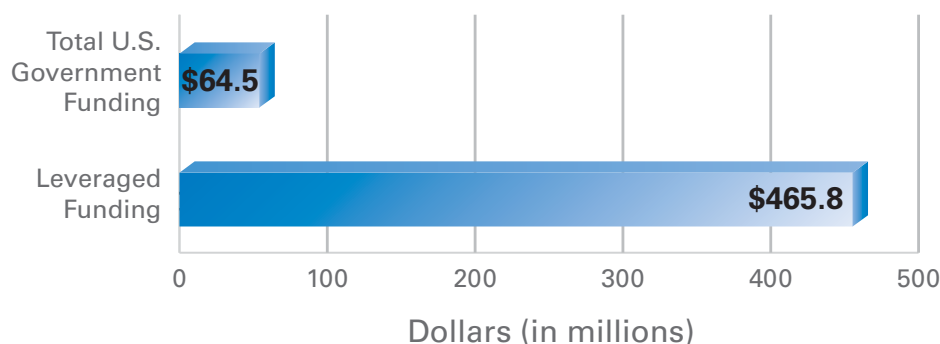


⁸ Expenditures for a large October 2011 Partnership-wide meeting in Krakow, Poland—with benefit to all GMI Partners—account for a significant portion of Europe's share (see page 7).

The funds committed by the United States have been instrumental in leveraging funding from other sources, dramatically increasing the reach and influence of U.S. financial support (see Figure 5). In this context, “leveraged” funding refers to financial (or in-kind) contributions to project development catalyzed by or building upon initial U.S. government contributions by other entities,

such as the World Bank, the Asian Development Bank, other Partner governments, and the private sector. The consistently strong U.S. support has been a major factor in the Initiative’s growth in size, scope, and influence. This solid foundation will help GMI reach its expanded goals as it works to advance methane projects around the world.

Figure 5: U.S. Government Funding and Leveraged Funding, FY 2005–FY 2011



Specific U.S. Government Efforts

The U.S. government has been actively helping to advance methane mitigation through project assistance and tracking, ongoing capacity-building, and workshop and conference support. Some of these efforts are highlighted below.

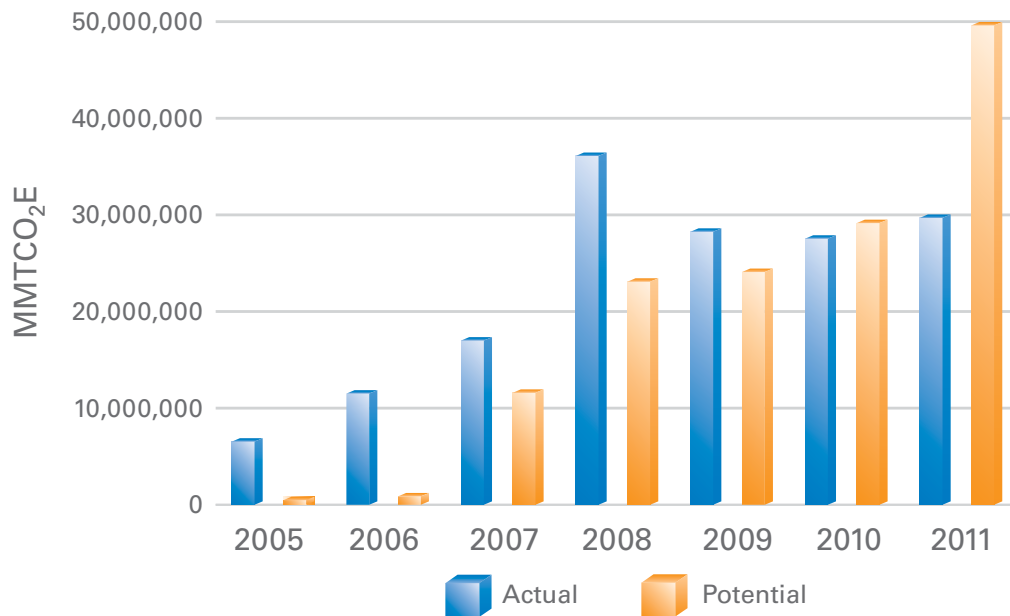
Tracking Emission Reductions in Partner Countries

GMI continues to track project-related emission reductions. Currently, GMI is tracking nearly 2,000 methane project sites around the world, of which the United States is providing technical, financial, or capacity-building support for about 700. From 2005 through 2011, potential and actual emission reductions from U.S.-supported projects approached nearly 141 MMTCO₂E and more than 159 MMTCO₂E, respectively (see Figure 6). In 2011, U.S.

efforts in support of GMI yielded actual annual emission reductions totaling approximately 30 MMTCO₂E. “Actual” emission reductions are those that have been achieved and measured from implemented projects in any given year. “Potential” represents annual emission reductions that have been identified through GMI capacity-building activities (e.g., prefeasibility or feasibility studies) that could be realized if the emission reduction project(s) were fully implemented.

Additionally, GMI has a new Web interface for sites and activities aimed at improving the ability to search for projects that are of interest to Partner Country delegates and Project Network members. The new interface allows a user to search by the sector as well as the country where the project is located.

Figure 6: Annual Methane Emission Reductions from U.S.-Supported Projects, 2005–2011



Ongoing Capacity-Building/Technology Transfer

In 2011, the United States continued to provide technical support for GMI. The United States held more than 20 workshops and “hands-on” technical demonstrations in more than 10 Partner Countries. One of these included an Asia-Pacific oil and gas sector meeting held in September 2011 in Jakarta, Indonesia (see page 22 for details) to discuss strategies for reducing methane emissions from oil and gas facilities. The United States also conducted site visits, hosted several U.S. study tours, and supported ongoing technology demonstrations (see Table 1 for some examples).

Promoting Project Financing Options

In April 2011, EPA co-sponsored a webinar about potential methane emission project financing options available from the Overseas Private Investment Corporation. This webinar—targeted at corporations, investors, project developers, energy service companies, and financial institutions with interest in emerging market investment opportunities—attracted more than 100 global attendees representing GMI Partner Countries and the Project Network.

Poland Hosts Partnership-wide Meeting

Building on the expanding Project Network and Partner Countries, GMI—in cooperation with the government of Poland—held a Partnership-wide meeting in Krakow in October 2011. The meeting attracted more than 160 Partner Country and Project Network representatives, government leaders, and technical experts from 31 countries. Marcin Korolec, Undersecretary of State with Poland’s Ministry of Economy, welcomed GMI to Poland and emphasized the importance of methane as a clean energy source. The meeting included sector-specific site tours and technical workshops, formation of a Municipal Wastewater Subcommittee, a tour of the World Heritage Site Wieliczka Salt Mine, and networking opportunities for participants.

The following sections highlight some of the notable 2011 activities and projects supported by the U.S. government in each of the five sectors: agriculture, coal mines, municipal solid waste, municipal wastewater, and oil and gas systems.

Table 1. Examples of 2011 Site Visits, Study Tours, and Technology Demonstrations

Activity	Sector	Locations/Participants
Site Visits	Agriculture	<ul style="list-style-type: none"> Farm digesters in China, Mexico, the Philippines, Thailand, and Vietnam. Poland's National Research Institute of Animal Production.
	Coal Mines	<ul style="list-style-type: none"> India's Ministry of Coal, the Ministry of Petroleum and Natural Gas, the Central Mine Planning and Design Institute (CMPDI), which operates the CMM Clearinghouse in Ranchi; the Central Institute of Mining and Fuel Research (CIMFR) in Dhanbad; and Essar Energy in Durgapur. Poland's Central Mining Institute of Katowice's experimental "Barbara" mine and JSW's "Pniowek" hard coal mine.
	Municipal Solid Waste	<ul style="list-style-type: none"> Contagem (Perobas) Landfill in Brazil. El Molle and Loma Los Colorados Landfills in Chile. Piyungan, Solo, Chipeucang, Bogor, and Bantar Landfills in Indonesia. "Barycz" Landfill in Poland. Kocael, Komurcuoda, and Kemerbergaz Odayeri Landfills in Turkey. Lugansk, Chernihiv, Mariupol, Kryukivshchyna, and Borispol Landfills in Ukraine.
	Oil and Gas	<ul style="list-style-type: none"> Poland's Gaz-System compressor station and laboratory. India's Gas Authority of India Limited (GAIL) natural gas compressor station and processing plant.
Study Tours to the United States	Municipal Solid Waste	<ul style="list-style-type: none"> Brazilian participants met with members of the National Association of Regulatory Utility Commissioners (NARUC), EPA, and other select organizations, and also visited U.S. landfill gas energy projects. Representatives from Mexico's TECMED (Técnicas Medioambientales) and Grupo Bimbo and Serbia's University of Novi Sad visited seven landfill gas to energy projects in Georgia, North Carolina, and South Carolina.
	Oil and Gas	<ul style="list-style-type: none"> Representatives from Russia's Gazprom, India's Oil and Natural Gas Corporation (ONGC), and Argentina's Empresa Nacional Del Petróleo (ENAP) Sipetrol visited facilities operated by Chevron, Oxy, and ConocoPhillips in Texas and New Mexico.
Technology Demonstrations	Agriculture	<ul style="list-style-type: none"> Household- to large-scale anaerobic digester demonstrations in China, the Philippines, Thailand, and Vietnam.
	Oil and Gas	<ul style="list-style-type: none"> Assisted a subsidiary company of the China National Petroleum Corporation (CNPC) to evaluate and purchase leak detection and measurement equipment.